

**臨床獣医学系専門部会特別講演  
(日本獣医師会共催)**

3月29日(土) 18:00~21:00 弥生講堂  
座長: 佐々木伸雄 (東大)

犬の緑内障 - 最近の話題から -

*Advances in the medical management of canine glaucoma*

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## Advances in the medical management of canine glaucoma

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The objective of this presentation is to review and update recent developments in the medical management of glaucoma.

Glaucoma is a complex syndrome associated with an increase in intraocular pressure subsequently resulting in damage to the ganglion cells of the optic nerve, eventually leading to blindness. Intraocular pressures can rise from either primary (inherited and congenital) or secondary causes. Most canine glaucoma is associated with primary causes, and is regularly seen in certain breeds.

### Treatment options

There are medical and surgical treatment options for canine glaucoma. Medical options include the use of various combinations of osmotic diuretics, carbonic anhydrase inhibitors, sympathomimetics, parasympathomimetics, alpha and beta blockers, and topical prostaglandins.

Medical management works well for a period in many cases, but eventually animals become refractory to treatment. Many veterinary ophthalmologists believe that canine glaucoma is a surgical disease. Surgical options include the use of anterior chamber shunts, cryosurgery, laser (cyclophotoablation) and cyclopharmacablation. Often a combination of medical and surgical management is needed to control canine glaucoma.

### Medical management

**Osmotic diuretics.** These are used for emergency of treatment of glaucoma. These are large molecular weight molecules that increase the osmotic pressure of plasma relative to the aqueous and vitreous humours. Resultant dehydration of the vitreous allows the lens and iris to move caudally, subsequently opening the iridocorneal angle. The other effect of these osmotic diuretics is to decrease the formation of aqueous humour from plasma.

#### Drugs:

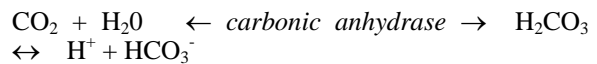
**Mannitol:** Given intravenously slowly over 15-20 minutes. Ensure the animals have an opportunity to urinate regularly. Expect maximum effect in 2-3 hours. This compound is not metabolised and so can be used in diabetes.

**Glycerol:** Can be given orally, but most dogs will vomit.

#### Carbonic anhydrase inhibitors (CAI)

Carbonic anhydrase is an enzyme in the non-pigmented ciliary epithelium responsible for

catalysing the following reaction resulting in the formation of aqueous humour.



Bicarbonate and sodium ions are actively transported into the anterior chamber, with passive movement of water. Between 40-60% of aqueous humour production is produced by this mechanism. Inhibition of *carbonic anhydrase* decreases the formation of bicarbonate and aqueous humour. These drugs are used in the short and long term treatment of glaucoma.

#### Drugs:

##### Topical

Because of the side effects of the systemic CAI's, considerable research has gone into developing topical carbonic anhydrase inhibitors. There are currently two products approved for people.

Brinzolamide (Azopt®) and dorzolamide (Trusopt®) Apply topically 3 times daily.

##### Systemic

Acetazolamide (Diamox®), dichlorphenamide (Daranide®) and methazolamide (Neptazane®)

The most common side effect is a metabolic acidosis seen as panting. Other effects can include vomiting, diarrhoea and hypokalemia.

##### Topical prostaglandins

It has been known for a while that prostaglandins result in decreased intraocular pressure. Based on this a number of prostaglandin F<sub>2α</sub> analogues have been developed. It is proposed that they increase aqueous humour outflow via the uveoscleral pathway. In the dog this comprises 15% of aqueous humour outflow.

#### Drugs:

These have been shown to have excellent efficacy in the dog. Recommended to only be used once daily. Some of the side effects seen following their use in dogs is an increase in conjunctivitis, uveitis and intense miosis. In people, latanoprost has also been associated with an increase in eyelid and iris pigmentation, but this has not been seen in dogs.

There are 4 products available. Latanoprost (Xalatan®), bimatoprost (Lumigan®), travoprost (Travatan®), unoprostone (Rescula®)